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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/748,256 12/27/00 CHEN

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021254
MCGINN & GIBB, PLLC
8321 OLD COURTHOUSE ROAD
SUITE 200
VIENNA VA 22182-3817

MM92/0329

EXAMINER

NADAV, D

ART UNIT

PAPER NUMBER

2811

DATE MAILED:

03/29/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/748,256

Applicant(s)

Chen et al.

Examiner

ORI NADAV

Group Art Unit

2811

☒ Responsive to communication(s) filed on Dec 27, 2000.

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 24-28 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 24-28 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because the claims are directed to a device, whereas the abstract is directed to a method of making the device. Correction is required. See MPEP § 608.01(b).
2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
3. The disclosure is objected to because of the following informalities: In the section "Brief Description of the Drawings" figures 1B-1D, 2B-2E and 4B-4C are not mentioned.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 25-28 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claimed invention comprises an amorphous silicon layer being converted to silicon layer, and STI's formed in the converted silicon layer. There is no support in the specification for a device comprising an amorphous silicon layer having STI's formed therein, as recited in claim 25.

7. The present invention comprises an amorphous silicon layer being converted to silicon layer, and STI's formed in the converted silicon layer. The text of the specification recites modifying the invention by using a SiGe epitaxial process to form islands with SiGe. There is no adequate description in the text of the specification as to enable one skilled in the art to which it pertains, or to make and/or use the device, as recited in claim 28.

8. Claims 24-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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9. The claimed limitations of the device recited in claim 28, are unclear as to which embodiment of the disclosure the device pertains, which figures depict the device, and how the converted SiGe layer is converted again from crystallized silicon to SiGe layer.

10. The claimed limitation of etching a portion of the SiGe layer to form a cavity, as recited in claim 28, is unclear as to how the SiGe layer can be etched after being converted to crystallized silicon layer.

11. Claims 24 and 28 recite the limitation "said at least one island" in lines 4. There is insufficient antecedent basis for this limitation in the claim.

12. Claim 24 recites the limitation "the islands" in line 13. There is insufficient antecedent basis for this limitation in the claim.

13. Claim 24 recites the limitation "the formed silicon layer" in line 8. There is insufficient antecedent basis for this limitation in the claim.

14. The claimed limitation of silicon layer above islands, as recited in claim 24, is unclear as to which islands applicant refers.

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15. Claim 28 recites the limitation "said at least one oxide island" in line 6. There is insufficient antecedent basis for this limitation in the claim.

16. Claim 28 recites the limitation "the formed SiGe" in line 8. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 24-28, insofar as in compliance with 35 U.S.C. 112, rejected under 35 U.S.C. 103(a) as being unpatentable over Witek et al. (6,146,970).

Witek et al. teach in figure 14 a substrate for mixed logic and memory applications comprising a buried oxide layer over a single crystal silicon substrate forming a bulk silicon region forming an SOI region (column 6, lines 9-10), an amorphous silicon layer 206 (column 6, lines 23-25) formed over the oxide layer, and STI's 210 formed at predetermined locations to remove defects on the SOI region, wherein a memory device is positioned in the bulk silicon region.

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Although Witek et al. do not explicitly disclose using STI's to remove defects on the SOI region, this feature is inherent in Witek et al.'s device, because Witek et al.' structure is identical to the claimed structure. Therefore, the claimed structure is considered to be in at least obvious over Witek et al.' structure.

Regarding claim 24, Witek et al. teach a planarized upper surface of the STI's, the substrate and the silicon layer.

Regarding the processing limitations recited in claims 24 and 28 ("forming an amorphous silicon/SiGe layer...being crystallizing..silicon" and planarizing an upper surface), these would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced. In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985).

19. Claims 24-28, insofar as in compliance with 35 U.S.C. 112, rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (5,767,549).

Regarding claim 28, Chen et al. teach in figure 1 a substrate for mixed logic and memory applications comprising a buried oxide island layer over a single crystal silicon substrate forming a bulk silicon region forming an SOI region 14, an SiGe layer 18 (column 2, line 65) formed over the oxide layer, and STI's 38 formed at predetermined

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locations to remove defects on the SOI region, wherein the SiGe layer is at least partially positioned on a bulk region of the substrate and the SOI portion of the substrate.

Although Chen et al. do not explicitly disclose forming the device using the processing limitations recited in claim 28 ("forming an SiGe layer...being crystallizing..silicon" and planarizing an upper surface), these would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced. In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985). Therefore, the claimed structure is considered to be in at least obvious over Chen et al.'s structure.

Regarding claim 24, Chen et al. teach a planarized upper surface of the STI's, the substrate and the silicon layer. Although Chen et al. do not teach an amorphous silicon layer formed on the silicon substrate, this is a processing limitation, since the amorphous silicon layer is later converted to silicon. Processing limitations recited in claim 24 ("forming an amorphous silicon layer...being crystallizing..silicon" and planarizing an upper surface), do not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced. In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985).

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Regarding claim 25, although Chen et al. do not explicitly disclose using STI's to remove defects on the SOI region, this feature is inherent in Chen et al.'s device, because Chen et al.' structure is identical to the claimed structure.

20. Claims 24-28, insofar as in compliance with 35 U.S.C. 112, rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchiaki (6,051,509).

Regarding claim 28, Tsuchiaki teaches in figure 6b a substrate for mixed logic and memory applications comprising a buried oxide island layer over a single crystal silicon substrate forming a bulk silicon region forming an SOI region, an SiGe layer (column 21, line 17) formed over the oxide layer, and STI's 201 formed at predetermined locations to remove defects on the SOI region, wherein the SiGe layer is at least partially positioned on a bulk region of the substrate and the SOI portion of the substrate.

Although Tsuchiaki does not explicitly disclose forming the device using the processing limitations recited in claim 28 ("forming an SiGe layer...being crystallizing..silicon" and planarizing an upper surface), these would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced. In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985). Therefore, the claimed structure is considered to be in at least obvious over Tsuchiaki's structure.

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Regarding claim 24, Tsuchiaki teaches a planarized upper surface of the STI's, the substrate and the silicon layer. Although Tsuchiaki does not teach an amorphous silicon layer formed on the silicon substrate, this is a processing limitation, since the amorphous silicon layer is later converted to silicon. Processing limitations recited in claim 24 ("forming an amorphous silicon layer...being crystallizing..silicon" and planarizing an upper surface), do not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced. In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985).

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References D-E and N-O are cited as being related to SOI devices comprising STI's.

Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

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Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to *Examiner Nadav* whose telephone number is **(703) 308-8138**. The Examiner is in the Office generally between the hours of 7 AM to 3 PM (Eastern Standard Time) Monday through Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas, can be reached at **(703) 308-2772**.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **308-0956**

Ori Nadav, Ph.D.

March 25, 2001

William Mintel

William Mintel
Primary Examiner
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